MODUL PRAKTIKUM 09 NETWORK ADDRESS TRANSLATION DAN WIRELESS LAN

TUJUAN

Setelah praktikum dilaksanakan, peserta praktikum diharapkan memiliki kemampuan

- 1. Melakukan konfigurasi NAT pada Linux Ubuntu 8.10
- 2. Melakukan konfigurasi NAT pada Windows Server 2008
- 3. Melakukan konfigurasi Access Point

PERANGKAT

Perangkat yang digunakan untuk praktikum adalah sbb :

- 1. Linux Ubuntu 8.10
- 2. Windows Server 2008
- 3. Access Point DWL-2100AP
- 4. Kabel UTP Straight atau Cross
- 5. Switch

PROSEDUR PRAKTIKUM

Berikut topologi yang akan dijadikan materi praktikum :



1. Melakukan konfigurasi NAT pada Linux Ubuntu 8.10

a. Tambahkan IP Address pada interface yang sesuai

		root	@ubuntu: /home/ubuntu	_ 🗆 🗙
<u>F</u> ile <u>E</u> dit	t <u>∨</u> iew <u>T</u> erminal	<u>T</u> abs	<u>H</u> elp	
root@ubu eth0	ntu:/home/ubunt Link encap:Et inet addr:192 UP BROADCAST RX packets:69 TX packets:68 collisions:0 RX bytes:1025 Interrupt:10	u# ifc hernet .168.1 RUNNIN 82 err 56 err txqueu 733 (1 Base a	onfig HWaddr 08:00:27:7a:01:91 .100 Bcast:192.168.1.255 Mask:255.255.255.6 G MULTICAST MTU:1500 Metric:1 ors:0 dropped:0 overruns:0 frame:0 ors:0 dropped:0 overruns:0 carrier:0 elen:1000 .0 MB) TX bytes:6403681 (6.4 MB) ddress:0xd020	
eth1	Link encap:Et inet addr:192 UP BROADCAST RX packets:74 TX packets:61 collisions:0 RX bytes:6484 Interrupt:9 E	hernet .0.2.1 RUNNIN 31 err 24 err txqueu 880 (6 ase ad	HWaddr 08:00:27:33:88:d0 Bcast:192.0.2.255 Mask:255.255.255.0 G MULTICAST MTU:1500 Metric:1 ors:0 dropped:0 overruns:0 frame:0 ors:0 dropped:0 overruns:0 carrier:0 elen:1000 .4 MB) TX bytes:894690 (894.6 KB) dress:0xd240	

b. Tambahkan default gateway dengan perintah

"route add default gw <ip_gateway>"

Σ	root@u	buntu: /home/ubu	intu		_
<u>F</u> ile <u>E</u> dit <u>∨</u> iew	<u>T</u> erminal <u>T</u> abs <u>H</u>	lelp			
root@ubuntu:/h Kernel IP rout	root@ubuntu:/home/ubuntu# route -n Kernel IP routing table				
Destination	Gateway	Genmask	Flags Metric	Ref Use	Iface
192.168.1.0	0.0.0.0	255.255.255.0	U 0	0 0	eth0
192.0.2.0	0.0.0.0	255.255.255.0	U O	0 0	eth1
root@ubuntu:/h	ome/ubuntu# route	add default gw	192.0.2.100		
root@ubuntu:/h	ome/ubuntu# route	-n			
Kernel IP rout	ing table				
Destination	Gateway	Genmask	Flags Metric	Ref Use	Iface
192.168.1.0	0.0.0.0	255.255.255.0	U 0	0 0	eth0
192.0.2.0	0.0.0.0	255.255.255.0	U 0	0 0	eth1
0.0.0.0	192.0.2.100	0.0.0.0	UG 0	0 0	eth1
root@ubuntu:/home/ubuntu#					

c. Hidupkan service Routing (ip_forwarding) dengan perintah

[&]quot;echo 1 > /proc/sys/net/ipv4/ip_forward"

	root@ubuntu: /	_ _ X
<u>F</u> ile <u>E</u> dit <u>∨</u> iew <u>T</u> er	rminal <u>T</u> abs <u>H</u> elp	
root@ubuntu:/# mor 0	e /proc/sys/net/ipv4/ip_forward	7
root@ubuntu:/# ech root@ubuntu:/# mor 1 root@ubuntu:/#	o 1 > /proc/sys/net/ipv4/ip_forward e /proc/sys/net/ipv4/ip_forward	

d. Periksa tabel NAT pada iptables dengan perintah

"iptables -nvL -t nat"

_ _ X
destination
destination
destination

root@ubuntu:/home/ubuntu#

- e. Tambahkan nat untuk jaringan lokal dengan perintah
 - "iptables -t nat -A POSTROUTING -s <local-network/prefix> -o <ethernet-public> -j SNAT -to <ip-public>"

root@ubuntu: /home/ubuntu	_
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>T</u> erminal <u>T</u> abs <u>H</u> elp	
root@ubuntu:/home/ubuntu# iptables -t nat -A POSTROUTING -s 192.16 h1 -j SNATto 192.0.2.1	58.1.0/24 -o et •
root@ubuntu:/home/ubuntu# iptables -nvL -t nat Chain PREROUTING (policy ACCEPT 1811 packate 172K bytec)	
pkts bytes target prot opt in out source	destination
Chain POSTROUTING (policy ACCEPT 5 packets, 590 bytes)	
pkts bytes target prot opt in out source	destination
0 0 SNAT all * eth1 192.168.1.0/24 to:192.0.2.1	0.0.0.0/0
Chain OUTPUT (policy ACCEPT 4 packets, 530 bytes) pkts bytes target prot opt in out source	destination

root@ubuntu:/home/ubuntu#

f. Jika ada kesalahan penambahan dalam table nat, dapat dihilangkan seluruhnya dengan perintah **"iptables –F –t nat"**

📧 root@ubuntu: /home/ubuntu	- • ×
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>T</u> erminal <u>T</u> abs <u>H</u> elp	
root@ubuntu:/home/ubuntu# iptables -F -t nat root@ubuntu:/home/ubuntu# iptables -nvL -t nat Chain PREROUTING (policy ACCEPT 1875 packets, 180K bytes)	<u>^</u>
pkts bytes target prot opt in out source	destination
Chain POSTROUTING (policy ACCEPT 5 packets, 590 bytes) pkts bytes target prot opt in out source	destination
Chain OUTPUT (policy ACCEPT 4 packets, 530 bytes) pkts bytes target prot opt in out source	destination
root@ubuntu:/nome/ubuntu#	

2. Melakukan konfigurasi NAT pada Windows Server 2008

a. Tambahkan IP Address pada interface yang sesuai

📾 Administrator: C:\Windows\system32\cmd.exe	
C:\>ipconfig	▲ ►
Windows IP Configuration	
Ethernet adapter Local Area Connection 2:	
Connection-specific DNS Suffix .: Link-local IPv6 Address : fe80::1c15:fb91:477a:639f%11 IPv4 Address	
Ethernet adapter Local Area Connection:	
Connection-specific DNS Suffix .: Link-local IPv6 Address : <u>fc90:-cE42:b41</u> 4:92a1:6cb2%10 IPv4 Address : 192.168.2.100 Subnet Mask : 255.255.255.0 Default Cateway	

b. Instalasi Routing and Remote Access melalui Server Manager

Recycle Bin		
Server Manager Command Prompt Windows Update Command Explorer Notepad	Administrator Documents Computer Network Control Panel Administrative Tools Help and Support Run	
All Programs Start Search	• •	
🞝 Start 🗍 🏪 📃		🔁 🔂 🕼 4:07 PM

c. Tambahkan peran Server agar menjadi Routing and Remote Access

E Server Manager		
File Action View Help		
🗢 🔿 🖄 🖬		
🖳 Server Manager (WIN-LNJ97F0CNF	Roles	
Roles Roles Add Roles Diag Remove Roles	View the health of the roles or remove roles and feature	installed on your server and add
	al/	
Refresh	Roles Summary	👔 Roles Summar
Help		
	Roles: 0 of 16 installed	Add Roles
	•	•
	Last Refresh: 3/1/2010 4:10:04 PM	Configure refresh
Remove roles from this server.		

d. Ikuti Wizard instalasi

Add Roles Wizard	× ×
Before You Begin	ц.
Before You Begin Server Roles Confirmation Progress Results	This wizard helps you install roles on this server. You determine which roles to install based on the tasks you want this server to perform, such as sharing documents or hosting a Web site. Before you continue, verify that: • The Administrator account has a strong password • Network settings, such as static IP addresses, are configured • The latest security updates from Windows Update are installed If you have to complete any of the preceding steps, cancel the wizard, complete the steps, and then run the wizard again. To continue, click Next. Skip this page by default
	< <u>Previous</u> <u>Install</u> Cancel

e. Pilih peran "Network Policy and Access Services"

Select Server Ro	les	
Before You Begin Server Roles Network Policy and Access Services Role Services Confirmation Progress Results	Select one or more roles to install on this server. Cative Directory Certificate Services Active Directory Domain Services Active Directory Pederation Services Active Directory Rights Management Services Active Server (Installed) Print Services Directory Services UDDI Services UDDI Services Windows Deployment Services Windows Deployment Services	Description: Network Policy and Access Services provides Network Policy Server (NPS), Routing and Remote Access, Health Registration Authority (HRA), and Host Credential Authorization Protocol (HCAP), which help safeguard the health and security of your network.



f. Pilih **"Routing and Remote Access Services"** serta konfirmasi instalasi

Select Role Services			
Before You Begin Server Roles Network Policy and Access Services Confirmation Progress Results	Select the role services to install for Network Policy and Access Services: Routing and Remote Access Services Remote Access Service Remote Access Service Reading and Remote Access Services Remote Access Service Reading and Remote Access Services Remote Access Service Reading and Remote Access Service Remote Access Service Reading Remote Access Service Remote Access Services used to connect network segments within a small office or to connect two private networks over the internet.		

Confirm Installat	ion Selections	
Before You Begin Server Roles Network Policy and Access Services Role Services Confirmation Progress Results	To install the following roles, role services, or features, click Install.	
		ß
	Print, e-mail, or save this information	
Installation Proc	jress	
Before You Begin	The following roles, role services, or features are being installed:	
Server Roles Network Policy and Access Services Role Services Confirmation Progress Results	Network Policy and Access Services	
	Initializing installation	
	< <u>Previous</u> <u>Next</u> > <u>Instal</u> Cancel	



g. Pengaturan Routing and Remote Access dapat dilakukan melalui **Administrative Tools – Routing And Remote Access**

Server Manager	<u>r</u>		
	Administrator		Terminal Services
Windows Update	Documents	۵,	Component Services
Internet Explorer	, Documents	*	Computer Management
	Computer	â	Data Sources (ODBC)
Notepad		Ø	DHCP
	Network	Å	DNS
Ease of Access Center			Event Viewer
	Control Panel	2	iSCSI Initiator
	Administrative Tools	A	Local Security Policy
			Memory Diagnostics Tool
	Help and Support		Network Policy Server
		2	Peliphility and Performance Monitor
	Run	-	Routing and Remote Access
		2	Use Routing and Remote Acce
			Services
			Share and Storage Management
			Storage Explorer
All Programs			System Configuration
Start Saard		ā	Task Scheduler
			Windows Firewall with Advanced Security
🎦 Start 📗 🔜 👘		2	Windows Server Backup

h. Setelah jendela Routing and Remote Access terbuka, klik kanan pada komputer dan pilih **"Configure and Enable Routing and Remote Access"**

Routing and Remote	Access		_0_	×
File Action View He	lp			
🗢 🔿 🖄 🖬 💥 (
Routing and Remote Ac	WIN-LNJ97F0CNRV (local)			
WIN-LNJ97FOCNR	Configure and Enable Routing and Remote Access		Remote	4
	All Tasks	•	ss, on the Action menu, click	
	View	•	up a Routing and Remote	
	Delete Refresh		troubleshooting, see <u>Routing</u>	
	Properties			
	Help			
				4
Configures Routing and Rem	ote Access for the selected server			

i. Ikuti Setup Wizard

Routing and Remote Access Server Setup Wizard				
	Welcome to the Routing and Remote Access Server Setup Wizard			
	This wizard helps you set up your server so that you can connect to other networks and allow connections from remote clients.			
	To continue, click Next.			
	< Baci Next > Cancel			

outing and Remote Access Server Setup Wizard	
Configuration You can enable any of the following combinations of services, or you can customize this server.	
 <u>Remote access (dial-up or VPN)</u> Allow remote clients to connect to this server through either a dial-up connection or a secure virtual private network (VPN) Internet connection. Network address translation (NAT) Allow internal clients to connect to the Internet using one public IP address. <u>Virtual private network (VPN) access and NAT</u> Allow remote clients to connect to this server through the Internet and local clients to connect to the Internet using a single public IP address. <u>Secure connection between two private networks</u> Connect this network to a remote network, such as a branch office. <u>Custom configuration</u> Select any combination of the features available in Routing and Remote Access. 	
For more information	
< <u>B</u> ack <u>N</u> ext > Cancel	
outing and Remote Access Server Setup Wizard	
Custom Configuration When this wizard closes, you can configure the selected services in the Routing and Remote Access console.	
	-

When this wizard closes, you can configure the selected services in the Routing and Remote Access console.
Select the services that you want to enable on this server. <u>V</u> PN access <u>D</u> ial-up access
 Dgmand-dial connections (used for branch office routing) NAT AN routing
For more information
< <u>B</u> ack <u>N</u> ext > Cancel

Routing and Remote Access Server Setup Wizard				
	Completing the R Access Server Se	couting and Remo tup Wizard	te	
	You have successfully con Access Server Setup wiza	mpleted the Routing and F ard.	Remote	
	Summary of selections:			
	LAN routing		<u> </u>	
	After you close this wizard in the Routing and Remot To close this wizard, click	, configure the selected se te Access console. Finish.	ervices	
	< <u>B</u> a	ck Finish	Cancel	



Routing) and Rem	ote Access	Server Setup W			
			Completing Access Ser	J the Routin ver Setup V	g and I Vizard	Remote
	Completi	ing Initializa	ation			a and Remote
	Ĩ	Please wait service finis	: while the Routing a shes initialization.	and Remote Acce	ess	
						V
			After you close th in the Routing an	iis wizard configu d Remote Acces	ure the sele ss console	ected services
			To close this wiza	ard, click Finish.		
				< <u>B</u> ack	Finish	Cancel

j. Tambahkan Routing Protocol baru melalui **"IPv4 – General – New Routing Protocol..."**

Routing and Remote Access				
File Action View Help				
🗢 🔿 🙍 📊 🖾 🗠 🕨	? 🖬			
Routing and Remote Access	General			
	Interface 🔻	Туре	IP Address	Incoming byt
	Loopback	Loopback	127.0.0.1	0
Remote Access Logging & F	Local Area Connection 2	Dedicated	192, 168, 2, 1	63,923
	Local Area Connection	Dedicated	192.168.1.100	65,603
Gener Statut	<u>33</u>	Internal	Not available	-
Static New Routing IPv6 IPv6 Gener Show TCP/IP Show Multicat Show Multicat View Refresh Export List Properties Help	Protocol Information st Forwarding Table st Statistics			
				<u> </u>
Add a new routing protocol				

k. Pilih NAT pada pilihan New Routing Protocol

New Routing Protocol	×
Click the routing protocol that you want to add, then click OK.	
	-
G DHCP Relay Agent	
GMP Router and Proxy	
NAI NAI Second Action of Action of Action of Action	
J	- 1
OK Cancel	

l. Tambahkan interface baru pada NAT

E Routing and Remote Access			
File Action View Help			
🧢 🔿 🖄 🛅 🔀 📾			
Routing and Remote Access	NAT		
Server Status	Interface 💌	Total mappings	Inbound packets translated
 Network Interfaces Remote Access Logging & F ■ IPv4 ■ General ■ Static Routes 		There are no item	is to show in this view.
	value of the second sec		
View	•		

m. Pilih interface public

New Interface for IPNAT	×
This routing protocol runs on the interface that you select below.	
Interfaces:	
	_
Local Area Connection	
Local Area Connection 2	

n. Pilih Public interface dan Enable NAT pada NAT Properties

Network Address Translation Properties - Local Area Connecti <u>?</u> 🔀
NAT Address Pool Services and Ports
Interface Type:
C Private interface connected to private network
Public interface connected to the Internet
Enable NAT on this interface
NAT enables clients on this network to send data to and receive data from the Internet using this interface.
For more information
OK Cancel Apply

3. Melakukan konfigurasi Access Point

- a. Reset Access Point dengan menekan tombol reset di bagian belakang Access Point D-Link DWL-2100AP
- b. Sambungkan Access Point dan LAN-Card pada PC
- c. Ganti IP Address LAN pada PC menjadi 192.168.0.1

capability. Otherwise, you need appropriate IP settings.	to ask your network administrator for
0 <u>O</u> btain an IP address automati	ically
Use the following IP address:	
P address:	192.168.0.1
S <u>u</u> bnet mask:	255 . 255 . 255 . 0
	Sa (22, 22)
Obtain DNS server address at Use the following DNS server Preferred DNS server:	Itomatically. addresses:

d. Tes ping ke 192.168.0.50, jika sudah reply maka Access Point dapat diakses melalui web browser dengan mengetikkan alamat http://192.168.0.50/



e. Gunakan username: admin dan password: <kosong> untuk login.

Connect to 192.1	68.0.50	? ×
R		GE
DWL-2100AP		
User name:	🖸 admin	
Password:	[
	Remember m	y password Cancel

f. Konfigurasi Wireless pada Access Point

Wireless Settings Wireless Band IFEE802110 Mode Access Point SSID iT-student SSID Broadcast Enable Channel 6 2.437 GHz Auto Channel Authentication Open System Image: Classical Colssical Colssico	Home	Advanced	Tools	Status	Help
Wireless Band IFFE802110 Mode Access Point SSID iT-student SSID Broadcast Enable Channel 6 2.437 GHz Auto Channel Authentication Open System Image: Classical Content Scan Key Settings Encryption © Disable Classical Content Scan Key Type HEX Key Size 64 Bits Valid Key First Image: Classical Content Scan Second Key Image: Classical Content Scan Image: Classical Content Scan Fourth Key Image: Classical Content Scan Image: Classical Content Scan	Wireless Setting	js	22		
Mode Access Point ▼ SSID iT-student SSID Broadcast Enable ▼ Channel 6 ▼ 2.437 GHz Auto Channel Authentication Open System Image: Comparison of the system Rey Settings Encryption	Wireless Band	IEEE802.11g			
SSID IT-student SSID Broadcast Enable Channel 6 2.437 GHz Auto Channel Scan Authentication Open System Encryption © Disable C Enable Key Type HEX First Valid Key First Second Key Third Key Fourth Key Fourth Key	Mode	Access Point			
SSID Broadcast Enable Channel 6 2.437 GHz Auto Channel Scan Authentication Open System Encryption © Disable C Enable Key Type HEX Valid Key First First Key Second Key Third Key Fourth Key	SSID	iT-student			
Channel 6 2.437 GHz Auto Channel Scan Authentication Open System Encryption Disable C Enable Key Type HEX Key Size 64 Bits Valid Key First First Key Second Key Third Key Fourth Key	SSID Broadcast	Enable 💌			
Authentication Open System Encryption Disable C Enable Key Type HEX Key Size 64 Bits Valid Key First First Key Second Key Third Key Fourth Key	Channel	6 • 2.437 GH	z 🗖 Auto Char	nnel Scan	
Key Settings Encryption © Disable Key Type HEX Key Size 64 Bits Valid Key First Second Key Third Key Fourth Key	Authentication	Open System			
Encryption © Disable C Enable Key Type HEX W Key Size 64 Bits W Valid Key First W First Key •••••••• Second Key Third Key Fourth Key	NET SEULUS	Leben exeren		_	
Key Type HEX Key Size 64 Bits Valid Key First Image: Second Key Second Key Image: Second Key Third Key Image: Second Key Fourth Key Image: Second Key	Encryption	Disable O Er	nable		
Valid Key First First First Key Second Key Third Key Fourth Key	Кеу Туре	HEX ¥	Key Size	64 Bits	*
First Key Second Key Third Key Fourth Key	Valid Key	First			
Second Key Third Key Fourth Key	First Key				
Third Key	Second Key				
Fourth Key	Third Kou				
Fourth Key	Third Key	1			
	Fourth Key	1			
			100		
Super G Mode Disable	Super G Mode	Disable	<u>M</u>		

g. Konfigurasi LAN

	High-Sp	eed 2.4GHz	Wireless Ac	cess
Home	Advanced	Tools	Status	H
LAN Settings				
Get IP From		Static (Manual)	•	
IP address		192.168.0.50		
Subnet Mask		255.255.255.0		
Default Gatew	av	0.0.0.0	1	

h. Konfigurasi Performance untuk optimasi performa.

Home	Advanced	Tools	Status	Help
Advance Wirel	less Settings			
Wireless Band	ſ	IEEE802.11g 👱	1	
Data Rate	Γ	Auto 💌		
Beacon Interval	(20 - 1000)	100		
DTIM (1 - 255)	1	1		
Fragment Lengt	h (256 - 2346)	2346		
RTS Length (256	6 - 2346)	2346		
Transmit Power	ſ	full		
802.11g Only	I	Disable 💌		
1 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	r	Charlandlana		

i. Konfigurasi Filter untuk mengatur MAC-Filter

		High-	Speed 2	2.4GHz Wire	less Acc	ess Point
DWL-2100AP	Home	Advanc	ed 📘	ools S	tatus	Help
	Wireless Acces Wireless Band	ss Settings /	WLAN Par	tition		
Performance	Access Control	Accept 💌				
Filter	Mac Address	EE:EE:EE:E	E:EE:EE	Save	M Apply	Cancel Help
1	MAC Addres	ss	Delete	MAC Addres	s	Delete
Grouping	ee:ee:ee:ee:ee:ee	e	×			

j. Konfigurasi Admin untuk mengatur password dan konfigurasi lain

H	lome	Advanced	Tools	Status	Help
Adm	inistrator S	Settings			
Limit	t Administ	rator IP			
	imit Admin	istrator IP 1			
ĩ	imit Admin	istrator IP 2			
	anna Aurina	istrator in 2			
Logi	n				
Logi User	n Name	admin			
Logi User Old F	n Name Password	admin			
Login User Old F	n Name Password	admin			
Login User Old F New	n Name Password Password	admin			

k. Melihat hasil konfigurasi keseluruhan

Home	Advanced	Tools	Status	Help
Device Informa	ation			-
	Firmw MAC Ade	are Version: v2. dress: 00:19:5b:3	20eu 6:db:cc	
Ethernet				
Get IP From:	1	Manual		
IP address:	1	92.168.0.50		
Subnet Mask:	2	255.255.255.0		
Gateway:	(0.0.0		
Wireless (802.	11g)			
SSID:	ī	T-student		
Channel:	E	5		
Super G Mode:	l l	Disabled		
Rate:	,	Auto		
Security Level:	(Open System / E	ncryption Disabled	